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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,866	02/13/2002	Jochen Peters	DE010031	9433

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EXAMINER

SKED, MATTHEW J

ART UNIT	PAPER NUMBER
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2655

DATE MAILED: 01/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/075,866	Applicant(s) PETERS, JOCHEN	
	Examiner Matthew J. Sked	Art Unit 2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 8 and 9 is/are rejected.
- 7) ☒ Claim(s) 3-7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. The objections to claims 8 and 9 are withdrawn in view of the amendment filed 10/24/05.
2. The rejections to claims 1 and 6 under 35 USC 112 are withdrawn in view of the amendment and arguments filed 10/24/05. The term "orthogonalized", herein, shall be interpreted to refer to the linear combination of two sets of desired boundary values that occur over different ranges.
3. The rejection of claim 2 under 35 USC 112 was not addressed so the rejection stands.
4. Applicant's arguments filed 10/24/05 have been fully considered but they are not persuasive

Claims 1-7 were rejected under 35 USC 101 as being directed towards non-statutory subject matter. Applicant argues, "Claim 1 provides a useful, concrete and tangible result and hence is patentable subject matter". The Examiner respectfully disagrees. Claim 1 states "A method of calculating iteration values for free parameters in a maximum entropy speech model". A speech model is an abstract/theoretical entity hence non-statutory. The rejection stands.

In order to make the claim statutory the speech model must be claimed for use in a concrete application. The Examiner's suggestion for amendment would be to change "a maximum-entropy speech model" in the preamble to --a maximum-entropy speech model in a speech recognition system--.

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5. Claims 1, 8 and 9 were rejected under 35 USC 103(a) and unpatentable over Peters et al. ("Compact Maximum Entropy Language Models"). Applicant argues Peters "fails to teach calculating values for free parameters as is recited in the claims". The Examiner respectfully disagrees. Peters describes calculating the values of free parameters according to equation 5, where $\lambda_{\alpha}^{(n+1)}$ is the updated free parameter, $\lambda_{\alpha}^{(n)}$ is nth iteration of the free parameters and $m_{\alpha}^{(n)}$ is the current marginal. The marginal is defined identically mathematically in equation 4 as the Applicant defines the boundary value in claim 2 hence they are equivalent. Therefore, the limitations of the claim are met and the rejection stands.

6. It is noted that the applicant did not traverse the Official Notice taken in the previous Office Action and therefore it is taken to be admitted prior art (see MPEP 2144.03).

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

8. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim makes reference to the variable t_{α} but does not define this term in the claim or in the independent claim. For the purposes of

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examination it will be assumed that the limitations of claim 4 are incorporated into the claim.

Claim Rejections - 35 USC § 101

9. Claims 1-7 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-7 are drawn to a mathematical algorithm, per se. Claims to processes that do nothing more than solve mathematical problems or manipulate abstract ideas or concepts are non-statutory. If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing all of the foregoing, the acts are not being applied to appropriate subject matter. Schrader, 22 F.3d at 294-95, 30 USPQ2d at 1458-59. Thus, a process consisting solely of mathematical operations without some claimed practical application is drawn to non-statutory subject matter. In this case, the claims merely recite the steps of calculating a function, without any practical application being recited.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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11. Claims 1, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peters et al. ("Compact Maximum Entropy Language Models") in view of Applicant's admitted prior art.

As per claim 1, Peters teaches a method of calculating iteration values for free parameters in the maximum entropy speech model in accordance with the following general training algorithm:

the (n+1) iteration for the free value of a current attribute of a speech model is a mathematical function of the n-th iteration value of the free parameters, the desired boundary value for alpha and the n-th iteration boundary value for the desired boundary value (equation 5); and

wherein each speech model attribute is assigned to an attribute group and the iteration values are calculated for each and every attribute for the currently assigned attribute group and the adaptation of the iteration values to the respective associated desired boundary values is the worst of all the m attribute groups (calculates the marginals for all the feature groups in order to optimize the method hence performing this calculation on the worst attribute groups, section 4.3).

Peters does not specifically teach or suggest using a predefined criterion to choose the worst attribute groups to update.

Applicant's admitted prior art teaches that choosing to optimize the worst set of data from a larger set of data is notoriously well known in the art.

It would have been obvious to use a predefined criterion to choose the worst attribute groups to update because it would save processing power and time to update only the boundary values that need to be updated.

As per claim 8, Peters does not teach a speech recognition system comprising a recognition device for recognizing the semantic content of an acoustic signal, in particular a voice signal, recorded by a microphone and made available, by mapping parts of this signal onto predefined recognition symbols as supplied by the maximum entropy speech model MESM, and for generating output signals which represent the recognized semantic content ; and a training arrangement for adapting the MESM to recurring statistical patterns in the speech of a specific user of the speech recognition system, characterized in that the training arrangement calculates free parameters in the MESM.

Applicant's admitted prior art teaches that using Maximum Entropy models in speech recognition is well known.

It would have been obvious to one of ordinary skill in the art at the time of invention to have a speech recognition system comprising a recognition device for recognizing the semantic content of an acoustic signal, in particular a voice signal, recorded by a microphone and made available, by mapping parts of this signal onto predefined recognition symbols as supplied by the maximum entropy speech model MESM, and for generating output signals which represent the recognized semantic content ; and a training arrangement for adapting the MESM to recurring statistical

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patterns in the speech of a specific user of the speech recognition system, characterized in that the training arrangement calculates free parameters in the MESM because it has been successfully applied to natural language processing hence giving better recognition results.

As per claim 9, Peters does not teach a training arrangement for adapting the maximum entropy speech model (MESM) in a speech recognition system to recurring statistical patterns in the speech of a specific user of the speech recognition system characterized in that the training arrangement calculates free parameters in the MESM.

Applicant's admitted prior art teaches that continually adapting speech models to a specific user is notoriously well known in the art.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Peters because it would create a specialized model for the current user hence giving better recognition results.

Allowable Subject Matter

12. Claim 2 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph and U.S.C. 101, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter: Claim 2 recites the combination of calculating the n-th iteration boundary value for the desired boundary value as the sum of the product of the frequency the string of

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words occurs in the training corpus, the probability the word follows the history and an attribute function and selects the attribute group according the largest value calculated through an equation calculated from the boundary values.

Peters teaches calculating the n-th iteration boundary value for the desired boundary value as the sum of the product of the frequency the string of words occurs in the training corpus, the probability the word follows the history and an attribute function (equation 4).

Peters does not teach selecting the attribute group according the largest value calculated through an equation calculated from the boundary values and attribute function. It would not have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Peters to arrive at the applicant's invention.

14. Claims 3-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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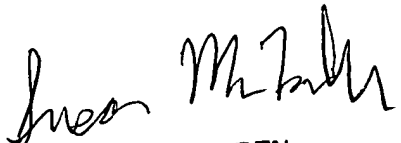
shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Sked whose telephone number is (571) 272-7627. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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01/04/06


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PRIMARY EXAMINER